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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BEYER WEAVER & THOMAS LLP			BAKER, DAVID S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

21

<b>Office Action Summary</b>	<b>Application No.</b> 10/688,839	<b>Applicant(s)</b> DELGADO ET AL.	
	<b>Examiner</b> David S. Baker	<b>Art Unit</b> 2878	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "160" has been used to designate both "clean purge gas" and "a plurality of screws". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly

labeled as “Annotated Sheets” and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanitsu (German Patent #DE 10062579 A1). This patent is not commonly available in English; as such, all the references to Tanitsu will correspond to the US filed patent document (US Patent #6,741,394) for convenience purposes.

Regarding claim 22, Tanitsu discloses, in figure 11 and columns 23-24, in a system comprising a lens (104, 151, 152) and a semiconductor substrate (112), a method of processing the semiconductor substrate (112), comprising: disposing the lens (104, 151, 152) along an optical path (AX); exposing the semiconductor substrate (112) to UV radiation, wherein the light propagates through the lens (104, 151, 152) along the optical path (AX); and disposing a transparent cover (153, 154) proximately to the lens to protect the lens from contamination.

Regarding claim 23, Tanitsu discloses, in figure 11 and columns 23-24, a system for processing a semiconductor surface (112), comprising: a lens (104, 151, 152) disposed along an optical path (AX); a transparent cover (153, 154) disposed proximately to the lens (104, 151,

Art Unit: 2878

152) between the lens (104, 151, 152) and the semiconductor surface (112) to protect the lens (104, 151, 152) from contamination.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-3, 7-9, 12-15, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uto (US Patent #6,831,737) in view of Arakawa (US Patent #6,757,048).

Regarding claim 1, Uto discloses, in figure 1 and column 2 lines 24-67 and columns 3-7, an inspection system for detecting defects on a sample (1) that comprises an optical subsystem (9,11, 12) configured to collect UV light (3) emanated from a sample. The optical subsystem (9,11, 12) includes an optical component (11) that has an exposed optical surface. The inspection systems further comprises a detector (13) to send an image of the sample to an analyzer (17,19) to determine if contaminants or defects are present. Uto does not disclose expressly a mechanism for protecting the exposed optical surface of the optical component from contaminants. Arakawa discloses, in figure 1A, 2A, 3A, 4, 6A, and 6B and columns 2-3 and column 6 lines 27-30 and column 8 lines 34-36, a mechanism (2, 3, 16, 22, 23, 31, 34) that purges contaminants to protecting the exposed optical surface of the optical component (30, and/or unlabelled optics in projection optical system 19). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the optical inspection system disclosed by Uto with the protection mechanism described in Arakawa. The suggestion/motivation for doing so would have been to protect the optical quality of the Uto system by eliminating contaminants via Arakawa's purge mechanism.

Regarding claims 2 and 3, which are dependant upon claims 1 and 2 respectively, Uto does not disclose expressly a gas purge system configured to produce a gas stream to block contaminants from the exposed optical surface of the optical component, that the gas stream transports the contaminants away, and that the gas stream is disposed between the sample and the optical component. With regards to claim 2, Arakawa discloses, in figure 1A, 2A, 3A, 4, 6A, and 6B and columns 2-3 and column 6 lines 27-30 and column 7 lines 21-34 and column 8 lines 34-36, a gas flow system (2, 3, 16, 22, 23, 31, 34) that produces a gas stream to purge and

prevent contaminants from reaching the optical component (30) and unlabeled optics in the projection optics system (19) and then carries the contaminants away. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a gas purge system. The suggestion/motivation for doing so would have been the need to clean the surface of the optical component so a scan would not confuse superficial contaminants with physical optical defects. With regards to claim 3, Arakawa discloses, in figure 1A and column 6 lines 20-24 and column 7 lines 21-34 and column 8 lines 34-36, that the gas flow system's nozzles (22, 23) supply the gas flow to the area between the exposed optical component (30) and the sample (21). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to dispose the gas stream between the sample and the optical component. The suggestion/motivation for doing so would have been the knowledge that by disposing the gas stream between the sample and optical component, the gas stream could clean and protect both the sample and the optical component at once.

Regarding claim 7, which is dependant upon claim 2, Uto does not disclose expressly a gas purge system comprising a cover between the optical component and the sample with the cover being configured to allow light to pass between the sample and the optical component as well as forming the gas stream between the sample and the optical component. Arakawa discloses, in figure 1A and column 7 lines 21-34 and column 8 lines 34-36, a transparent cover (35) disposed between the optical component (30) and the sample that has nozzles (23) that allows the gas stream to flow between the optical component (30, and/or unlabeled optics in projection optical system 19) and the sample. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the use of a cover with mean of

Art Unit: 2878

transferring gas between the optical components and the sample. The suggestion/motivation for doing so would have been to create a physical barrier for contaminants as well as allowing the gas stream to clean both areas without requiring a separate gas source or pipes.

Regarding claim 8, which is dependant upon claim 2, Uto does not disclose expressly a transparent cover that physically blocks the contaminants from reaching the optical surface of the optical component. Arakawa discloses, in figure 1A and column 7 lines 21-34 and column 8 lines 34-36, a transparent cover (35) that physically blocks contaminants from the optical component (30, and/or unlabeled optics in projection optical system 19) and hence the exposed optical surfaces. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate a physical barrier that could transmit radiation. The suggestion/motivation for doing so would have been to add further protection to the optical components that could be cleaned and would help increase the overall quality of the optical readings taken by keeping contaminants off the exposed optical surface.

Regarding claim 9, which is dependant upon claim 1, Uto does not disclose expressly a transparent cover that physically blocks contaminants from reaching the optical surface of the optical component. Arakawa discloses, in figure 1A and column 7 lines 21-34 and column 8 lines 34-36, a transparent cover (35) that physically blocks contaminants from the optical component (30, and/or unlabelled optics in projection optical system 19) and hence the exposed optical surfaces. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate a physical barrier that could transmit radiation. The suggestion/motivation for doing so would have been to add further protection to the optical



components that would increase the overall quality of the optical readings taken by keeping contaminants off the exposed optical surface.

Regarding claim 12, which is dependant upon claim 1, Uto discloses, in column 1 lines 6-22, that the sample is associated with semiconductor manufacturing.

Regarding claim 13, which is dependant upon claim 12, Uto discloses, in column 1 lines 6-22, that the sample is a reticle, mask, or wafer.

Regarding claim 14, which is dependant upon claim 1, Uto discloses, in figure 1 and in column 5 lines 31-39, that the optical component is a lens (11).

Regarding claim 15, which is dependant upon claim 1, Uto does not disclose expressly that the contaminants are hydrocarbons, inorganics, or moisture. Arakawa disclose, in column 2 lines 21- 33, that the contaminants may be oxygen or moisture. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to also realize that the gas purge system has the ability to purge contaminant such as hydrocarbons, inorganics, and moisture. The suggestion/motivation for doing so would have been the knowledge that while specifying moisture and oxygen (an inorganic), Arakawa's gas purge system could also be used to purge hydrocarbons.

Regarding claim 21, Uto discloses, in figure 1 and column 2 lines 24-67 and columns 3-7, a system for inspecting substrates (1) that comprises an optical subsystem (9,11) having a front lens (11) configured to collect UV light (3) emanated from a sample. Uto does not disclose expressly a cover disposed between the front lens and the substrate where the cover has an opening for UV light passage between the front lens and the substrate and where the cover defines a channel within which a gas stream may pass to clean and prevent particles from

depositing on the front lens. Arakawa discloses, in figure 1A and column 7 lines 3-34 and column 8 lines 34-36, a cover (35) disposed between a lens (30, and/or unlabeled optics in projection optical system 19) and the substrate (21) that has an opening (in cover 22) that UV light may pass through while simultaneously defining a channel which through a gas stream flows to prevent particles from depositing on the front lens (30, and/or unlabeled optics in projection optical system 19). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the optical inspection system disclosed by Uto with the protection mechanism described in Arakawa. The suggestion/motivation for doing so would have been to protect the optical quality of the Uto system by eliminating contaminants via Arakawa's cover mechanism.

10. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uto (US Patent #6,831,737) and Arakawa (US Patent #6,757,048) as applied to claims 2 and 3 above, and further in view of Engelsberg (US Patent #5,531,857).

Regarding claim 4, which is dependant upon claim 3, Uto and Arakawa do not disclose expressly that the gas stream flows parallel to the optical component. Engelsberg discloses, in column 10 lines 28-35, a parallel gas stream configuration. At the time the invention was made it would have been obvious to a person of ordinary skill in the art to orient the gas stream parallel to the surface of the substrate. The suggestion/motivation for doing so would have been to accommodate different orientations for the inspection chamber as well as providing a simple geometry for the gas flow system.

Regarding claim 5, which is dependant upon claim 2, Uto and Arakawa do not disclose expressly that the gas stream is symmetrical. Engelsberg discloses, in column 14 lines 35-39, a

symmetric gas flow arrangement. At the time the invention was made it would have been obvious to anyone of ordinary skill in the art to create a symmetrical gas flow geometry. The suggestion/motivation for doing so would have been to allow for an equal amount of gas to pass over the entire substrate so that the amount of contaminant removed is symmetrically similar.

11. Regarding claim 6, which is dependant upon claim 2, Uto and Arakawa do not disclose expressly that the gas stream is asymmetrical. Engelsberg discloses, in column 14 lines 32-34, a gas flow geometry that is asymmetrical by way of forming a gas stream that flows from one circumferential side of a radiation conduit to the furthest circumferential side from the gas conduit. At the time the invention was made it would have been obvious to someone of ordinary skill in the art to create an asymmetrical gas flow geometry. The suggestion/motivation for doing so would have been to eliminate any dead spots in the gas flows such as at the center of a circularly symmetrical gas flow arrangement.

12. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uto (US Patent #6,831,737) and Arakawa (US Patent #6,757,048) as applied to claim 9 above, and further in view of Hershel (US Patent #4,391,494).

Regarding claim 10, which is dependant upon claim 9, Uto and Arakawa do not disclose expressly that the transparent cover include an optical membrane with a frame. Hershel discloses, in column 6 lines 1-28, a pellicle as an optical membrane that is held in a frame (12). At the time the invention was make it would have been obvious to a person of ordinary skill in the art to protect an optical component with an optical membrane held in place by a frame. The suggestion/motivation for doing so would have been to prevent any contaminants from reaching the optical component as well as allowing for the interchangeability of the optical membrane.

Regarding claim 11, which is dependant upon claim 10, Uto and Arakawa do not disclose expressly that the membrane is disposed between the sample and optical component. Hershel discloses, in column 6 lines 1-28, that the optical membrane protects the optical component (20). At the time the invention was made it would have been obvious to a person of ordinary skill in the art to orient the optical membrane between the optical component and the sample. The suggestion/motivation for doing so would have been to protect the optical component from any contaminants associated with the sample.

13. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uto (US Patent #6,831,737) in view of Engelsberg (US Patent #5,531,857)

Regarding claim 16, Uto discloses, in figure 1 and column 2 lines 24-65, an optical inspection system with an exposed optical surface as part of a lens (11). Uto does not disclose expressly a gas flow system capable of being used in the inspection system where the gas stream is flowed in front of an optical surface of the optical inspection system to prevent contaminants from adversely affecting the exposed optical surface of the inspection system. Engelsberg discloses, in figures 1-2, and column 4 lines 29-57, a gas flow system comprising a gas flow stream (18) that removes and prevents contaminants from degrading a substrate. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the gas flow system of Engelsberg's with the optical inspection devices of Uto. The suggestion/motivation for doing so would have been to create an increased quality of inspection due to the cleaning and protection offered by the gas flow stream over the optical components.

Regarding claim 17, which is dependant upon claim 16, Uto discloses, in column 2 lines 24-64, that the optical inspection system has an optical surface that is a lens capable of directing UV light.

Regarding claim 18, which is dependant upon claim 16, Uto does not expressly disclose a gas stream that effectively removes the contaminant in the region proximate the exposed optical surface. Engelsberg discloses, in column 12 lines 13-57, how the gas stream effectively removes contaminants in the region proximate the exposed surface. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a gas stream that effectively removes contaminants proximate to the optical surface. The suggestion/motivation for doing so would have been Arakawa's teaching of placing a protective cover between the optical component and the sample and Hershel's teaching that the cover may be an optical membrane for the need to keep clean the optical surface from contaminants.

Regarding claim 19, which is dependant upon claim 16, Uto does not disclose expressly a gas stream routed substantially transverse to the optical axis of the exposed optical surface. Engelsberg discloses, in figure 2 and column 13 lines 31-56, a gas stream (18) that is substantially transverse to the longitudinal axis of the gas conduit by way of a gas discharge end that is movable relative to the longitudinal axis of the radiation axis direction and can direct the gas stream radially outward from the longitudinal axis of the radiation axis. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to dispose the gas stream transverse to the optical axis where the transverse direction would be that directed radially outward from the optical axis also understood as the radiation axis direction. The suggestion/motivation for doing so would have been to allow the gas stream to sweep from one

side to the other all the contaminants off and away from the exposed optical surface while avoiding any dead spots in the flow.

Regarding claim 20, which is dependent upon claim 16, Uto does not disclose expressly a gas stream routed substantially parallel to the optical axis of the exposed optical surface. Engelsberg discloses, in column 14 lines 13-39, a gas stream that is substantially parallel to the optical axis of the exposed optical surface such that the gas stream blows on the location at which the radiation is targeted for all orientations of the optical axis that is defined by the direction at which the radiation is hitting the exposed optical surface. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to dispose a gas flow stream parallel to the optical axis. The suggestion/motivation for doing so would have been to always have the gas flow stream pointing in the same direction as the lens is pointing so as to ensure the area being inspected is also being currently cleaned.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Baker whose telephone number is 571-272-6003. The examiner can normally be reached on MTWRF 8:00-5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2878

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David S Baker  
Examiner  
Art Unit 2878

DSB



**DAVID PORTA**  
**SUPERVISORY PATENT EXAMINER**  
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